IN THE CLAIMS

What is claimed is:

1. A computer software product including one or more recordable media having executable instructions stored thereon which, when executed by a processing device, causes the processing device to:

strengthen a first antecedent label for an edge in an assertion graph.

2. The computer software product recited in Claim 1 which, when executed by a processing device, further causes the processing device to:

abstract a second antecedent label to produce the first antecedent label.

3. The computer software product recited in Claim 1 wherein strengthening the antecedent label comprises causing the processing device to:

join any pre-images for antecedent labels of outgoing edges from the edge in the assertion graph; and

keep in the strengthened antecedent label for the edge only what is already contained by the first antecedent label for the edge and also contained by the joined pre-images for antecedent labels of outgoing edges from the edge.

4. The computer software product recited in Claim 1 which, when executed by a processing device, further causes the processing device to:

compute a simulation relation for the edge from the strengthened antecedent label; and

compare the simulation relation for the edge to a consequence label for the edge.

5. The computer software product recited in Claim 4 wherein computing the simulation relation comprises causing the processing device to:

identify in the strengthened antecedent label of the edge any states that are also contained by a post-image for a simulation relation of an edge incoming to the edge in the assertion graph; and

join to the simulation relation for the edge, the identified states.

6. The computer software product recited in Claim 4 wherein comparing the simulation relation to a consequence label comprises causing the processing device to:

determine whether the simulation relation for the edge is contained by the consequence label for the edge.

7. The computer software product recited in Claim 4 wherein comparing the simulation relation to a consequence label comprises causing the processing device to:

negate a Boolean expression of the simulation relation for the edge, and:

logically combine the negated Boolean expression with a Boolean expression of the consequence label for the edge using a logical OR operation.

8. The computer software product recited in Claim 4 wherein computing a simulation relation for the edge from the strengthened antecedent label comprises causing the processing device to:

compute a simulation relation abstraction for the edge; and

concretize the simulation relation abstraction for the edge to produce the simulation relation for the edge.

9. The computer software product recited in Claim 8 wherein computing a simulation relation for the edge from the strengthened antecedent label further comprises causing the processing device to:

abstract the strengthened antecedent label to produce an antecedent label abstraction for the edge; and

use the antecedent label abstraction to compute the simulation relation abstraction for the edge.

10. A method comprising:

strengthening a first antecedent label for an edge in an assertion graph;

11. The method recited in Claim 10 wherein strengthening the antecedent label comprises:

joining pre-images of antecedent labels of any outgoing edges from the edge in the assertion graph; and

keeping, in the strengthened antecedent label for the edge, states already contained by the first antecedent label for the edge and also contained by the joined pre-images of antecedent labels of any outgoing edges from the edge.

12. The method recited in Claim 10 wherein the first antecedent label is one of a plurality of antecedent labels including a second antecedent label encoded along with the first antecedent label into a third antecedent label by a symbolic indexing function.

13. The method recited in Claim 10 further comprising:

computing a simulation relation for the edge from the strengthened antecedent label; and

comparing the simulation relation for the edge to a consequence label for the edge.

14. The method recited in Claim 13 wherein comparing the simulation relation to a consequence label comprises:

determining whether the simulation relation for the edge is contained by the consequence label for the edge.

15. The method recited in Claim 13 wherein comparing the simulation relation to a consequence label comprises:

negating a Boolean expression of the simulation relation for the edge, and:

logically combining the negated Boolean expression with a Boolean expression of the consequence label for the edge using a logical OR operation.

16. A method comprising:

computing a first simulation relation for an edge in a first assertion graph from a first antecedent label for the edge;

computing a second simulation relation for the edge from a concretization function applied to the first simulation relation for the edge; and

comparing the second simulation relation for the edge with a

consequence label for a corresponding edge in a second assertion graph to see if the second simulation relation is contained by the consequence label.

17. The method recited in Claim 16 further comprising:

computing the first antecedent label as an abstraction of a second antecedent label for the corresponding edge in the second assertion graph.

18. The method recited in Claim 17 further comprising:

computing the second antecedent label by strengthening a third antecedent label for the edge in the second assertion graph.

19. The method recited in Claim 16 further comprising:

computing a third antecedent label for the edge in the first assertion graph as an abstraction of a second antecedent label for the corresponding edge in the second assertion graph; and

computing the first antecedent label by strengthening the third antecedent label for the edge in the first assertion graph.

20. A verification system comprising:

means for strengthening an first antecedent label for an edge in an assertion graph;

21. The verification system of Claim 20 wherein the means for strengthening the antecedent label comprises:

means for joining any pre-images for antecedent labels of outgoing edges from the edge in the assertion graph; and

means for keeping, in the strengthened antecedent label for the edge, states already contained by the first antecedent label for the edge and also

contained by the joined pre-images for antecedent labels of outgoing edges from the edge.

22. The verification system of Claim 20 wherein the first antecedent label is one of a plurality of antecedent labels including a second antecedent label encoded along with the first antecedent label into a third antecedent label by a symbolic indexing function.

23. The verification system of Claim 20 further comprising:

means for computing a simulation relation for the edge from the strengthened antecedent label; and

means for comparing the second simulation relation for the edge with a consequence label for a corresponding edge in a second assertion graph to check if the second simulation relation is contained by the consequence label.

24. The verification system of Claim 23 wherein the means for comparing the simulation relation to a consequence label comprises:

means for determining whether the simulation relation for the edge is contained by the consequence label for the edge.

25. A verification system comprising:

means for computing a first simulation relation for an edge in a first assertion graph from a first antecedent label for the edge;

means for computing a second simulation relation for the edge from a concretization function applied to the first simulation relation for the edge; and

means for comparing the second simulation relation for the edge with a

consequence label for a corresponding edge in a second assertion graph to see if the second simulation relation is contained by the consequence label.

26. The verification system of Claim 26 further comprising:

means for computing the first antecedent label as an abstraction of a second antecedent label for the corresponding edge in the second assertion graph.

27. The verification system of Claim 27 further comprising:

means for computing the second antecedent label by strengthening a third antecedent label for the edge in the second assertion graph.

28. The verification system of Claim 26 further comprising:

means for computing a third antecedent label for the edge in the first assertion graph as an abstraction of a second antecedent label for the corresponding edge in the second assertion graph; and

means for computing the first antecedent label by strengthening the third antecedent label for the edge in the first assertion graph.

29. A verification system comprising:

a recordable medium to store executable instructions;

a processing device to execute instructions; and

a plurality of executable instructions that when executed by the processing device, cause the processing device to strengthen a antecedent label for an edge in an assertion graph.

30. The verification system of Claim 4 wherein the plurality of executable instructions, when executed by the processing device, further cause the

processing device to:

compute a first simulation relation for the edge; and

concretize the first simulation relation computed for the edge to produce a second simulation relation for the edge.